

Parturition in the Indian Vespertilionid Bat, *Pipistrellus ceylonicus chrysothrix* (Wroughton)

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(With nine figures in two plates)

Details of parturition were observed in several females of *Pipistrellus ceylonicus chrysothrix* (Wroughton) kept in cages. Before delivery the mother assumes a peculiar posture by hooking the claws of her toes and thumbs to the wire mesh in the ceiling of the cage with her belly facing the ceiling. The wings and the tail patagia are curled to form a cradle-like structure into which the young are delivered. Two young are born. Breech presentation was noticed and each young takes about 15 to 20 minutes to emerge. There is an interval of about 15 to 20 minutes between deliveries. The umbilical cords of the two young remain attached to the placenta until both placental discs come out 35 to 40 minutes after the delivery of the second young. The mother eats the placenta. At birth the eyelids of the young are adherent, and skin naked without much pigmentation. The young accidentally separated from the mothers, are not retrieved.

INTRODUCTION

The process of delivery of the young in bats is of considerable interest to zoologists and to naturalists because of the peculiar resting posture of these animals, and because of their many anatomical specializations. Further, the newly born young is relatively enormous in size, and weighs between 15% to 25% of the adult body weight (Gopalakrishna 1969).

Details of parturition are available with respect to only a few species of bats, and even amongst these there seem to be marked differences in the process of delivery. The posture that the female assumes during delivery varies among the different species. *Cynopterus* and *Hipposideros* (Ramakrishna 1950) deliver their young while they are in their natural posture. On the other hand the female of *Myotis lucifugus lucifugus* (Wimsatt 1945, 1960) assumes an inverted position (that is, head up for the bats) during delivery. In *Corynorhinus*

rafinesquei (Pearson *et al.* 1952) the mother during labour assumes a peculiar cradle-like posture by hooking the claws of the thumbs and the toes to projections in the ceiling. With regard to the emergence of the young at birth, whereas the young emerges with breech presentation in the vespertilionids (Wimsatt 1945, 1960; Pearson *et al.* 1952), delivery occurs with head presentation in *Cynopterus*, *Hipposideros* (Ramakrishna 1950) and in *Rhinopoma kinneari* (Anand Kumar 1965).

Pipistrellus ceylonicus chrysothrix is a small bat with an adult body weight of 7 to 8 gm. and a wing span of about 25 cm. It occurs in small colonies ranging from 24 to 200. The species inhabits old houses and dilapidated buildings and the bats roost between wooden rafters, and inside cracks in the walls and ceiling. The specimens for the present study were collected from old buildings in and around Nanded in Marathwada, Maharashtra.

Pipistrellus ceylonicus chrysothrix has a sharply marked breeding period (Madhavan, unpublished). Pregnant specimens in progressively advanced stages of gestation occur from about the second week of July to about the middle of September. Deliveries take place during the first two weeks of September after a gestation of 50 to 55 days. Normally each female bears two embryos in each pregnancy and brings forth two young in each litter. In very rare cases a single embryo or triplets are borne. The young at birth weighs about 1.25 gm.

MATERIAL AND METHODS

Several females in late pregnancy, were kept in cages between the 4th and the 13th of September 1968. Although many deliveries were actually observed, in 23 specimens the entire birth sequence was studied and almost minute to minute record kept of the various events during parturition. It is noteworthy that all deliveries took place during day between 6 a.m. and 7 p.m.

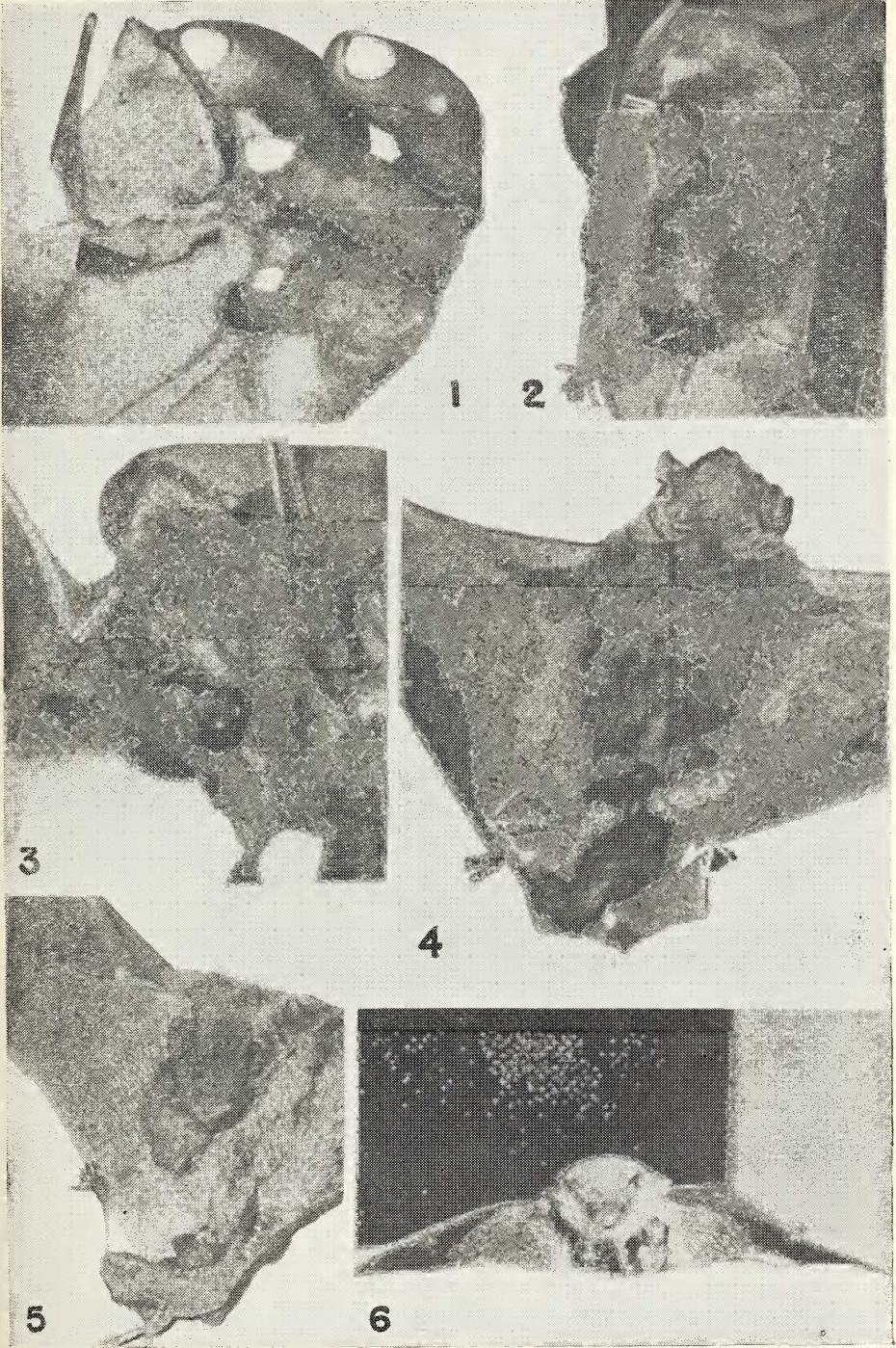
Detailed observations were made of many deliveries without handling the animals and without disturbing them in any way. But on some occasions the females exhibiting pre-parturitional activities were removed from the cages and kept on the laboratory table or held in the hand to note the details of parturition. Since it was impossible to take the photographs of the animals within the cages because of the peculiar posture of the mother in labour, the female under observation was removed from the cage for a few seconds and photographed while either holding her in the hand or after placing her on the laboratory table. She was returned to the cage immediately after taking the photograph.

OBSERVATIONS

The female which is about to deliver can easily be recognized amongst the caged specimens by her restless movements, frequent micturations, and constant licking of vaginal orifice. She appears irritable, and on many occasions was seen to bite her own patagia. For about 15 to 20 minutes before the first young one begins to come out of the vaginal opening, the abdominal wall of the mother at approximately two to four minutes intervals seems to have a series of paroxysms of contractions, each lasting a fraction of a second. During this period the fœtus appears to be moving inside the uterus, and this impression is created as the flanks of the mother show the presence of two longitudinal bulges as if the body wall was being pushed from within by two hard objects. These are the two fœtuses pressed against the body wall of the mother from within. A few minutes before the young begins to emerge the mother moves to the top of the cage and assumes a characteristic posture, with the legs widely separated and hooked to the wire mesh of the top of the cage. The wings are widely spread out and the thumbs hooked to the wire mesh. The uropatagium and the wing patagia are curled backwards so that the body of the mother, along with the patagium membranes, forms a cradle-like structure with the belly of the mother acting as a cushion. Since the ventral surface of the mother faces the ceiling of the cage all details of parturition can be easily observed by looking through the top of the cage. After assuming this posture the mother becomes very quiet and remains still. This is an indication that the young will soon emerge.

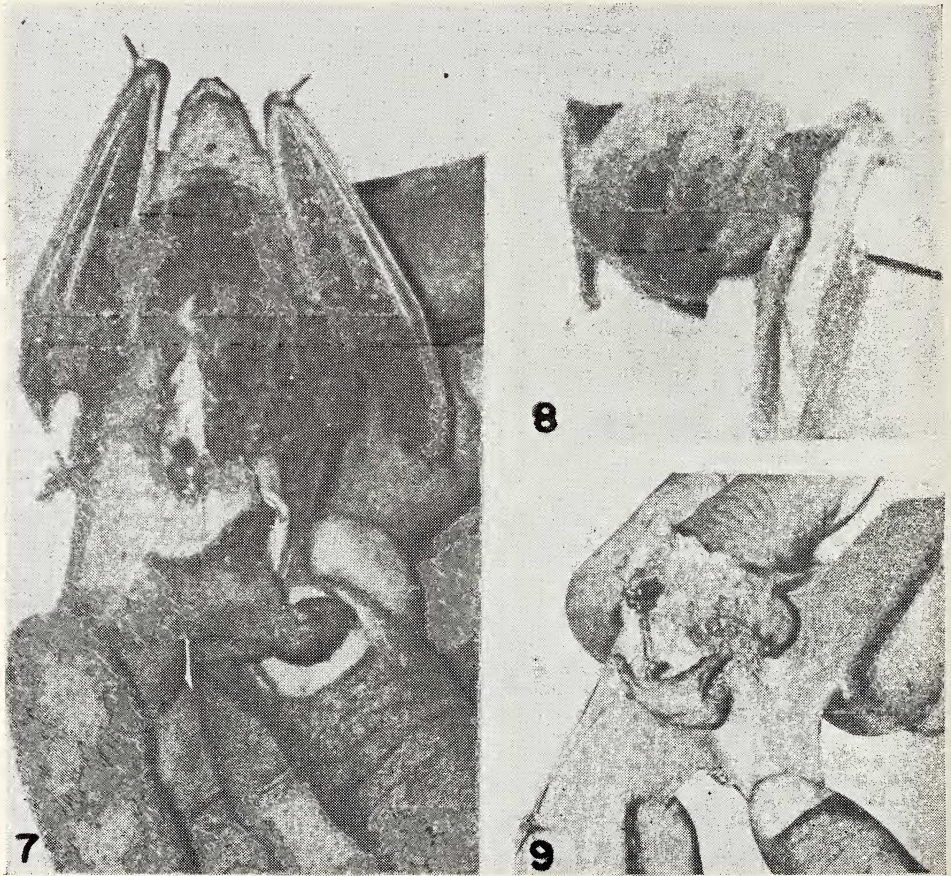
A clear fluid oozes out of the vagina about a minute before the young begins to emerge, and the posterior part of the abdomen of the mother appears to be puffed up. The pubic symphysis stretches accentuating the swollen appearance of the posterior part of the abdomen. As the young emerges, the uropatagium is strongly curved up, and the wing patagia are also brought close together as if to form a receptacle to prevent the young from dropping off. During the emergence of the young the mother constantly bends her neck towards the vaginal opening, and continuously licks the body of the emerging young. To one watching the process of parturition in this bat, it appears as if the mother, by repeatedly curling the body in a ventral flexure, is trying to apply some pressure on her own belly to facilitate the ejection of the young from the uterus. The young normally comes out in breech presentation. From the time the body of the young is first seen it takes about 15 to 20 minutes for the entire body to come out of the vagina. Only in one case, out of the so many deliveries observed, did the wing patagium of the young come out first. This was in the second young delivered by the mother, the first having been

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Parturition in *Pipistrellus ceylonicus chrysothrix*
(For details see Plate II)

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FIGS. 1. The mother a few minutes before parturition ; 2. First young emerging. Note the breech presentation ; 3. First young delivered and attached to the nipple of the mother. Second young emerging ; 4. An instance of abnormal delivery. Second young being delivered with the wing emerging first. First young is dangling with umbilical cord still attached to the placenta inside the mother ; 5. Both young have been delivered. The mother is pulling the first young towards her breast. Note the persistent umbilical cords ; 6. Delivery while the mother is lying on the table. The first young delivered and attached to the breast. Second emerging ; 7. Both young delivered ; one is on breast and the other crawling on inter-femoral membrane. Placenta emerging with umbilical cords still attached ; 8. Posture of the mother when delivery occurs while she is hanging to a vertical surface ; 9. The mother eating the placenta.